

WHAT IS CLAIMED IS:

1. A method of manufacturing an electro-optical device, said method comprising the steps of:

forming a plurality of TFTs over a substrate;

5 forming a plurality of pixel electrodes each being connected to one of the plurality of TFTs; and

forming an EL layer over the plurality of pixel electrodes,

wherein the EL layer is formed by an ink-jet method, and

wherein the EL layer is continuous over the plurality of pixel electrodes.

10 2. A method of manufacturing an electro-optical device, said method comprising the steps of:

forming a plurality of TFTs over a substrate;

forming a plurality of pixel electrodes each being connected to one of the plurality of TFTs; and

15 forming an EL layer over the plurality of pixel electrodes,

wherein the EL layer is formed by an ink-jet method, and

wherein the EL layer has an oblong shape or a rectangular shape corresponding to each of the plurality of pixel electrodes.

20 3. A method of manufacturing an electro-optical device, said method comprising the steps of:

forming a plurality of TFTs over a substrate;

forming a plurality of pixel electrodes each being connected to one of the plurality of TFTs;

forming first EL layers for emitting a red color light over first pixel electrodes in the plurality of pixel electrodes;

5 forming second EL layers for emitting a green color light over second pixel electrodes in the plurality of pixel electrodes; and

forming third EL layers for emitting a blue color light over third pixel electrodes in the plurality of pixel electrodes,

wherein the first, second and third EL layers are formed by an ink-jet method,  
10 and

wherein the first, second and third EL layers are continuous over the plurality of pixel electrodes.

4. A method of manufacturing an electro-optical device, said method comprising the steps of:

15 forming a plurality of TFTs over a substrate;

forming a plurality of pixel electrodes each being connected to one of the plurality of TFTs;

forming first EL layers for emitting a red color light over first pixel electrodes in the plurality of pixel electrodes;

20 forming second EL layers for emitting a green color light over second pixel electrodes in the plurality of pixel electrodes; and

forming third EL layers for emitting a blue color light over third pixel electrodes in the plurality of pixel electrodes,

wherein the first, second and third EL layers are formed by an ink-jet method,  
and

wherein each of the first, second and third EL layers has an oblong shape or  
a rectangular shape corresponding to each of the plurality of pixel electrodes.

5        5. A method of manufacturing an electro-optical device, said method comprising the  
steps of:

forming a plurality of TFTs over a substrate;

forming an insulating layer covering the plurality of TFTs;

forming a plurality of pixel electrodes each being connected to one of the

10    plurality of TFTs; and

forming an EL layer over the plurality of pixel electrodes,

wherein the EL layer is formed by an ink-jet method,

wherein the EL layer is continuous over the plurality of pixel electrodes,

and

15        wherein an insulating film for preventing transmission of alkali metals is formed  
in a top layer of the insulating layer.

6. A method of manufacturing an electro-optical device, said method comprising  
the steps of:

forming a plurality of TFTs over a substrate;

20        forming an insulating layer covering the plurality of TFTs;

forming a plurality of pixel electrodes each being connected to one of the  
plurality of TFTs; and

forming an EL layer on the plurality of pixel electrodes,  
wherein the EL layer is formed by an ink-jet method, and  
wherein the EL layer has an oblong shape or a rectangular shape corresponding  
to each of the plurality of pixel electrodes, and  
5 wherein an insulating film for preventing transmission of alkali metals is formed  
in a top layer of the insulating layer.

7. A method of manufacturing an electro-optical device, said method comprising the  
steps of:

forming a plurality of TFTs over a substrate;  
10 forming an insulating layer covering the plurality of TFTs;  
forming a plurality of pixel electrodes each being connected to one of the  
plurality of TFTs;  
forming first EL layers for emitting a red color light over first pixel electrodes  
in the plurality of pixel electrodes;  
15 forming second EL layers for emitting a green color light over second pixel  
electrodes in the plurality of pixel electrodes; and  
forming third EL layers for emitting a blue color light over third pixel  
electrodes in the plurality of pixel electrodes,  
wherein the first, second and third EL layers are formed by an ink-jet  
20 method,  
wherein the first, second and third EL layers are continuous over the plurality  
of pixel electrodes, and  
wherein an insulating film for preventing transmission of alkali metals is formed

in a top layer of the insulating layer.

8. A method of manufacturing an electro-optical device, said method comprising the steps of:

- forming a plurality of TFTs over a substrate;
- 5 forming an insulating layer covering the plurality of TFTs;
- forming a plurality of pixel electrodes each being connected to one of the plurality of TFTs;
- forming first EL layers for emitting a red color light over first pixel electrodes in the plurality of pixel electrodes;
- 10 forming second EL layers for emitting a green color light over second pixel electrodes in the plurality of pixel electrodes; and
- forming third EL layers for emitting a blue color light over third pixel electrodes in the plurality of pixel electrodes,
- wherein the first, second and third EL layers are formed by an ink-jet method,
- 15 and
- wherein each of the first, second and third EL layers has have an oblong shape or a rectangular shape corresponding to each of the plurality of pixel electrodes, and
- wherein an insulating film for preventing transmission of alkali metals is formed in a top layer of the insulating layer.

- 20 9. A method according to claim 1,
- wherein the electro-optical device includes a plurality of pixels,
  - wherein each of the plurality of pixels includes adjacent pixel electrodes each

other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of 5 to 10 times of a thickness of the EL layer.

10. A method according to claim 9,

5 wherein the gap is in a range of 250-2500 nm.

11. A method of according to claim 1,

wherein the EL layer comprises an organic material.

12. A method of according to claim 1,

wherein the ink jet method uses a piezo element.

10 13. A method according to claim 5,

wherein the insulating layer comprises the insulating film for preventing transmission of alkali metals on an insulating film including an organic resin material.

14. A method according to claim 5,

15 wherein the insulating film for preventing transmission of alkali metals comprises at least one element selected from the group consisting of B (boron), C (carbon), and N (nitrogen), Al (aluminum), Si (silicon), and P (phosphorous).

15. A method according to claim 5,

wherein the insulating film for preventing transmission of alkali metals comprises Si, Al, N, O, and M,

wherein M denotes at least one rare earth element, preferably at least one element selected from the group consisting of Ce (cerium), Yb (ytterbium), Sm (samarium), Er (erbium), Y (yttrium), La (lanthanum), Gd (gadolinium), Dy (dysprosium), and Nd (neodymium).

16. An electro-optical device comprising:

a plurality of TFTs being formed over a substrate;

a plurality of pixel electrodes each being connected to one of the plurality of

10 TFTs; and

an EL layer being formed over the plurality of pixel electrodes,

wherein the EL layer is formed to be continuous over the plurality of pixel electrodes.

17. An electro-optical device comprising:

15 a plurality of TFTs being formed over a substrate;

a plurality of pixel electrodes each being connected to one of the plurality of

TFTs; and

an EL layer being formed over the plurality of pixel electrodes,

20 wherein the EL layer has an oblong shape or a rectangular shape corresponding to each of the plurality of pixel electrodes.

18. An electro-optical device comprising:

a plurality of TFTs being formed over a substrate;

a plurality of pixel electrodes each being connected to one of the plurality of

TFTs;

5 first EL layers for emitting a red color light being formed over first pixel electrodes in the plurality of pixel electrodes;

second EL layers for emitting a green color light being formed over second pixel electrodes in the plurality of pixel electrodes; and

third EL layers for emitting a blue color light being formed over third pixel electrodes in the plurality of pixel electrodes,

10 wherein the first, second and third EL layers are formed to be continuous over the plurality of pixel electrodes.

19. An electro-optical device comprising:

a plurality of TFTs being formed over a substrate;

a plurality of pixel electrodes each being connected to one of the plurality of

15 TFTs;

first EL layers for emitting a red color light being formed over first pixel electrodes in the plurality of pixel electrodes;

second EL layers for emitting a green color light being formed over second pixel electrodes in the plurality of pixel electrodes; and

20 third EL layers for emitting a blue color light formed over third pixel electrodes in the plurality of pixel electrodes,

wherein each of the first, second and third EL layers has an oblong shape or a rectangular shape corresponding to each of the plurality of pixel electrodes.



20. An electro-optical device comprising:

a plurality of TFTs being formed on a substrate;

an insulating layer covering the plurality of TFTs;

a plurality of pixel electrodes each being connected to one of the plurality of

5 TFTs; and

an EL layer being formed on the plurality of pixel electrodes,

wherein the EL layer is formed to be continuous over the plurality of pixel electrodes, and

wherein an insulating film for preventing transmission of alkali metals is formed

10 in a top layer of the insulating layer.

21. An electro-optical device comprising:

a plurality of TFTs being formed on a substrate;

an insulating layer covering the plurality of TFTs;

a plurality of pixel electrodes each being connected to one of the plurality of

15 TFTs; and

an EL layer being formed on the plurality of pixel electrodes,

wherein the EL layer has an oblong shape or a rectangular shape corresponding to each of the plurality of pixel electrodes, and

wherein an insulating film for preventing transmission of alkali metals is formed

20 in a top layer of the insulating layer.

22. An electro-optical device comprising:

a plurality of TFTs being formed on a substrate;

an insulating layer covering the plurality of TFTs;

a plurality of pixel electrodes each being connected to one of the plurality of TFTs;

first EL layers for emitting a red color light being formed over first pixel electrodes in the plurality of pixel electrodes;

second EL layers for emitting a green color light being formed over second pixel electrodes in the plurality of pixel electrodes; and

third EL layers for emitting a blue color light being formed over third pixel electrodes in the plurality of pixel electrodes,

wherein the first, second and third EL layers are formed to be continuous over the plurality of pixel electrodes, and

wherein an insulating film for preventing transmission of alkali metals is formed in a top layer of the insulating layer.

23. An electro-optical device comprising:

a plurality of TFTs being formed on a substrate;

an insulating layer covering the plurality of TFTs;

a plurality of pixel electrodes each being connected to one of the plurality of TFTs;

first EL layers for emitting a red color light being formed over first pixel electrodes in the plurality of pixel electrodes;

second EL layers for emitting a green color light being formed over second pixel electrodes in the plurality of pixel electrodes; and

third EL layers for emitting a blue color light being formed over third pixel

electrodes in the plurality of pixel electrodes,

wherein each of the first, second and third EL layers has an oblong shape or a rectangular shape corresponding to each of the plurality of pixel electrodes, and

wherein an insulating film for preventing transmission of alkali metals is formed  
5 in a top layer of the insulating film.

24. A device according to claim 16,

wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each  
other,

10 wherein a gap between one pixel and an adjacent pixel thereof is in a range of  
5 to 10 times of a thickness of the EL layer.

25. A device according to claim 24,

wherein the gap is in a range of 250-2500 nm.

26. A device according to claim 16,

15 wherein the EL layer comprises an organic material.

27. A device according to claim 20,

wherein the insulating layer comprises the insulating film for preventing  
transmission of alkali metals on an insulating film including an organic resin material.

28. A device according to claim 20,

wherein the insulating film for preventing transmission of alkali metals comprises at least one element selected from the group consisting of B (boron), C (carbon), and N (nitrogen), Al (aluminum), Si (silicon), and P (phosphorous).

5 29. A device according to claim 20,

wherein the insulating film for preventing transmission of alkali metals comprises Si, Al, N, O, and M,

wherein M denotes at least one rare earth element, preferably at least one element selected from the group consisting of Ce (cerium), Yb (ytterbium), Sm (samarium), Er (erbium), Y (yttrium), La (lanthanum), Gd (gadolinium), Dy (dysprosium), and Nd (neodymium).

30. A device according to claim 17,

wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each

15 other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of 5 to 10 times of a thickness of the EL layer.

31. A device according to claim 30,

wherein the gap is in a range of 250-2500 nm.

20 32. A device according to claim 17,

wherein the EL layer comprises an organic material.

33. A device according to claim 18,

wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each

5 other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of

5 to 10 times of a thickness of each of the first, second and third EL layers.

34. A device according to claim 33,

wherein the gap is in a range of 250-2500 nm.

10 35. A device according to claim 18,

wherein each of the first, second and third EL layers comprises an organic material.

36. A device according to claim 19,

wherein the electro-optical device includes a plurality of pixels,

15

wherein each of the plurality of pixels includes adjacent pixel electrodes each

other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of

5 to 10 times of a thickness of each of the first, second and third EL layers.

37. A device according to claim 36,

wherein the gap is in a range of 250-2500 nm.

38. A device according to claim 19,

wherein each of the first, second and third EL layers comprises an organic

5 material.

39. A device according to claim 20,

wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each

other,

10

wherein a gap between one pixel and an adjacent pixel thereof is in a range of

5 to 10 times of a thickness of the EL layer.

40. A device according to claim 39,

wherein the gap is in a range of 250-2500 nm.

41. A device according to claim 20,

15

wherein the EL layer comprises an organic material.

42. A device according to claim 21,

wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each

other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of 5 to 10 times of a thickness of the EL layer.

43. A device according to claim 42,

5 wherein the gap is in a range of 250-2500 nm.

44. A device according to claim 21,

wherein the EL layer comprises an organic material.

45. A device according to claim 21,

10 wherein the insulating layer comprises the insulating film for preventing transmission of alkali metals on an insulating film including an organic resin material.

46. A device according to claim 21,

wherein the insulating film for preventing transmission of alkali metals comprises at least one element selected from the group consisting of B (boron), C (carbon), and N (nitrogen), Al (aluminum), Si (silicon), and P (phosphorous).

15 47. A device according to claim 21,

wherein the insulating film for preventing transmission of alkali metals comprises Si, Al, N, O, and M,

wherein M denotes at least one rare earth element, preferably at least one element selected from the group consisting of Ce (cerium), Yb (ytterbium), Sm

(samarium), Er (erbium), Y (yttrium), La (lanthanum), Gd (gadolinium), Dy (dysprosium), and Nd (neodymium):

48. A device according to claim 22,

wherein the electro-optical device includes a plurality of pixels,

5 wherein each of the plurality of pixels includes adjacent pixel electrodes each other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of 5 to 10 times of a thickness of each of the first, second and third EL layers.

49. A device according to claim 48,

10 wherein the gap is in a range of 250-2500 nm.

50. A device according to claim 22,

wherein each of the first, second and third EL layers comprises an organic material.

51. A device according to claim 22,

15 wherein the insulating layer comprises the insulating film for preventing transmission of alkali metals on an insulating film including an organic resin material.

52. A device according to claim 22,

wherein the insulating film for preventing transmission of alkali metals comprises at least one element selected from the group consisting of B (boron), C



(carbon), and N (nitrogen), Al (aluminum), Si (silicon), and P (phosphorous).

53. A device according to claim 22,

wherein the insulating film for preventing transmission of alkali metals comprises Si, Al, N, O, and M,

5 wherein M denotes at least one rare earth element, preferably at least one element selected from the group consisting of Ce (cerium), Yb (ytterbium), Sm (samarium), Er (erbium), Y (yttrium), La (lanthanum), Gd (gadolinium), Dy (dysprosium), and Nd (neodymium).

54. A device according to claim 23,

10 wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of 5 to 10 times of a thickness of each of the first, second and third EL layers.

15 55. A device according to claim 54,

wherein the gap is in a range of 250-2500 nm.

56. A device according to claim 23,

wherein each of the first, second and third EL layers comprises an organic material.

57. A device according to claim 23,

wherein the insulating layer comprises the insulating film for preventing transmission of alkali metals on an insulating film including an organic resin material.

58. A device according to claim 23,

5 wherein the insulating film for preventing transmission of alkali metals comprises at least one element selected from the group consisting of B (boron), C (carbon), and N (nitrogen), Al (aluminum), Si (silicon), and P (phosphorous).

59. A device according to claim 23,

10 wherein the insulating film for preventing transmission of alkali metals comprises Si, Al, N, O, and M,

wherein M denotes at least one rare earth element, preferably at least one element selected from the group consisting of Ce (cerium), Yb (ytterbium), Sm (samarium), Er (erbium), Y (yttrium), La (lanthanum), Gd (gadolinium), Dy (dysprosium), and Nd (neodymium).

15 60. A method according to claim 2,

wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each other,

20 wherein a gap between one pixel and an adjacent pixel thereof is in a range of 5 to 10 times of a thickness of the EL layer.

61. A method according to claim 60,  
wherein the gap is in a range of 250-2500 nm.

62. A method of according to claim 2,  
wherein the EL layer comprises an organic material.

5 63. A method of according to claim 2,  
wherein the ink jet method uses a piezo element.

64. A method according to claim 3,  
wherein the electro-optical device includes a plurality of pixels,  
wherein each of the plurality of pixels includes adjacent pixel electrodes each  
10 other,  
wherein a gap between one pixel and an adjacent pixel thereof is in a range of  
5 to 10 times of a thickness of each of the first, second and third EL layers.

65. A method according to claim 64,  
wherein the gap is in a range of 250-2500 nm.

15 66. A method of according to claim 3,  
wherein each of the first, second and third EL layers comprises an organic  
material.

67. A method according to claim 3,

wherein the ink jet method uses a piezo element.

68. A method according to claim 4,

wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of 5 to 10 times of a thickness of each of the first, second and third EL layers.

69. A method according to claim 68,

wherein the gap is in a range of 250-2500 nm.

70. A method of according to claim 4,

wherein each of the first, second and third EL layers comprises an organic material.

71. A method of according to claim 4,

wherein the ink jet method uses a piezo element.

72. A method according to claim 5,

wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each

other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of 5 to 10 times of a thickness of the EL layer.

73. A method according to claim 72,

5 wherein the gap is in a range of 250-2500 nm.

74. A method of according to claim 5,

wherein the EL layer comprises an organic material.

75. A method of according to claim 5,

wherein the ink jet method uses a piezo element.

10 76. A method according to claim 6,

wherein the electro-optical device includes a plurality of pixels,

wherein each of the plurality of pixels includes adjacent pixel electrodes each

other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of

15 5 to 10 times of a thickness of the EL layer.

77. A method according to claim 76,

wherein the gap is in a range of 250-2500 nm.

78. A method of according to claim 6,  
wherein the EL layer comprises an organic material.

79. A method of according to claim 6,  
wherein the ink jet method uses a piezo element.

5 80. A method according to claim 6,  
wherein the insulating layer comprises the insulating film for preventing  
transmission of alkali metals on an insulating film including an organic resin material.

81. A method according to claim 6,  
wherein the insulating film for preventing transmission of alkali metals  
10 comprises at least one element selected from the group consisting of B (boron), C  
(carbon), and N (nitrogen), Al (aluminum), Si (silicon), and P (phosphorous).

82. A method according to claim 6,  
wherein the insulating film for preventing transmission of alkali metals  
comprises Si, Al, N, O, and M,  
15 wherein M denotes at least one rare earth element, preferably at least one  
element selected from the group consisting of Ce (cerium), Yb (ytterbium), Sm  
(samarium), Er (erbium), Y (yttrium), La (lanthanum), Gd (gadolinium), Dy  
(dysprosium), and Nd (neodymium).

83. A method according to claim 7;

wherein the electro-optical device includes a plurality of pixels,  
wherein each of the plurality of pixels includes adjacent pixel electrodes each  
other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of  
5 5 to 10 times of a thickness of each of the first, second and third EL layers.

84. A method according to claim 83,

wherein the gap is in a range of 250-2500 nm.

85. A method of according to claim 7,

wherein each of the first, second and third EL layers comprises an organic  
10 material.

86. A method of according to claim 7,

wherein the ink jet method uses a piezo element.

87. A method according to claim 7,

wherein the insulating layer comprises the insulating film for preventing  
15 transmission of alkali metals on an insulating film including an organic resin material.

88. A method according to claim 7,

wherein the insulating film for preventing transmission of alkali metals  
comprises at least one element selected from the group consisting of B (boron), C  
(carbon), and N (nitrogen), Al (aluminum), Si (silicon), and P (phosphorous).

89. A method according to claim 7,

wherein the insulating film for preventing transmission of alkali metals comprises Si, Al, N, O, and M,

wherein M denotes at least one rare earth element, preferably at least one  
5 element selected from the group consisting of Ce (cerium), Yb (ytterbium), Sm (samarium), Er (erbium), Y (yttrium), La (lanthanum), Gd (gadolinium), Dy (dysprosium), and Nd (neodymium).

90. A method according to claim 8,

wherein the electro-optical device includes a plurality of pixels,

10 wherein each of the plurality of pixels includes adjacent pixel electrodes each other,

wherein a gap between one pixel and an adjacent pixel thereof is in a range of  
5 to 10 times of a thickness of each of the first, second and third EL layers.

91. A method according to claim 90,

15 wherein the gap is in a range of 250-2500 nm.

92. A method of according to claim 8,

wherein each of the first, second and third EL layers comprises an organic material.

93. A method of according to claim 8,

20 wherein the ink jet method uses a piezo element.



94. A method according to claim 8,

wherein the insulating layer comprises the insulating film for preventing transmission of alkali metals on an insulating film including an organic resin material.

95. A method according to claim 8,

5 wherein the insulating film for preventing transmission of alkali metals comprises at least one element selected from the group consisting of B (boron), C (carbon), and N (nitrogen), Al (aluminum), Si (silicon), and P (phosphorous).

96. A method according to claim 8,

10 wherein the insulating film for preventing transmission of alkali metals comprises Si, Al, N, O, and M,

wherein M denotes at least one rare earth element, preferably at least one element selected from the group consisting of Ce (cerium), Yb (ytterbium), Sm (samarium), Er (erbium), Y (yttrium), La (lanthanum), Gd (gadolinium), Dy (dysprosium), and Nd (neodymium).